

California Energy Commission
Dockets Office, MS-4
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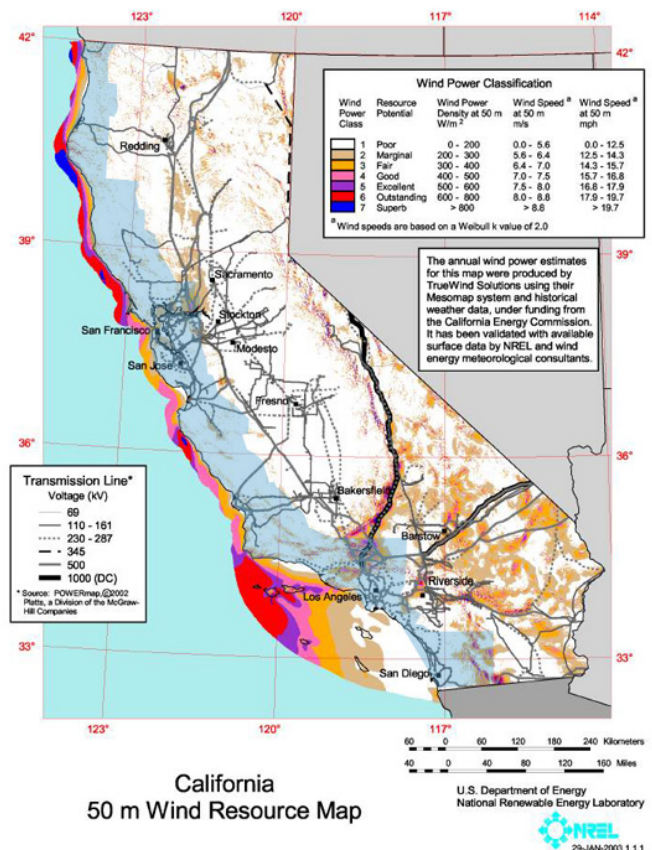
Re: Docket No. 12-EPIC-01, 2015-17 Electric Program Investment Charge (EPIC) Program - Second Triennial Investment Plan

Dear Energy Commission Staff:

I am writing to comment on the *2015-17 Electric Program Investment Charge (EPIC) Program - Second Triennial Investment Plan*. The Schatz Energy Research Center applauds the Commission's forward-looking inclusion of many emerging clean energy technologies that hold great promise for California. We would like to recommend that the plan be amended to support research, development, demonstration, and deployment of technologies that can be used to exploit California's vast and untapped offshore renewable energy resources.

Offshore energy makes sense for California. EPRI has estimated that the California coastline could theoretically produce 587 Twh per year of wave energy, or 23% of the national potential. NREL estimates the state's offshore winds could produce 2,420 Twh per year, or 14% of the national potential. As shown in the figure at right, offshore winds are by far the state's most important wind resource. Much of the state's onshore wind energy potential has either been built out or is off-limits to development. In addition, 69% of the state's population, accounting for 64% of California's 2012 electricity use, lives in the 22 counties closest to the coast (shaded in blue on the map), making electricity demand well matched geographically with offshore supplies. Furthermore, offshore wind and wave energy offer higher plant capacity factor than other renewable energy sources being developed in the state, including solar and onshore wind. Looking to the future beyond California's anticipated achievement of a 33% renewable electricity mix by 2020, these offshore resources can play an important role.

Offshore wind energy and, to a lesser extent, wave energy, have already been commercialized



map courtesy of National Renewable Energy Laboratory

to some degree elsewhere in the world. However, California has not yet seen significant deployment of these technologies. Research, development, and demonstration of these technologies will create jobs and can help establish our state as a key player in the offshore renewables market. Failure to do so, on the other hand, will likely result in lost opportunities as other states and countries leap ahead of California in these green technology industries. In addition, special conditions found on the west coast of the continental U.S., including steep ocean floor gradients and potential environmental impacts, call for research and development in order to realize wave and offshore wind's energy generation potential for California.

The first EPIC triennial investment plan included strategic objectives to "investigate the economic, environmental and technical barriers to offshore wind in California" (S4.4) and to "develop analytical tools and technologies to reduce energy stresses on aquatic resources and improve water-energy management" (S5.3). The latter of these addressed potential environmental impacts of both offshore wind and wave energy. The Commission has the opportunity with the second investment plan to maintain the momentum on offshore renewable energy established with these commitments made in the first plan and advance into early, pre-commercial deployment of these technologies.

The Schatz Energy Research Center has a 25-year history of development and testing renewable energy systems, hydrogen fuel cells, biomass energy conversion devices, and energy technologies for the developing world. Locally in Humboldt County, we played supporting roles in Shell Wind's planned Bear River Ridge onshore wind project and PG&E's WaveConnect project (both since suspended). We are now about to begin work as a partner on the recently funded CalWave project, a \$1.15 million collaboration between Cal Poly San Luis Obispo, Humboldt State University, and several private and public partners that will assess wave energy potential off the coasts of Humboldt and Santa Barbara Counties.

We have a special interest in offshore energy, as these resources are exceptional in our area, and the region has suitable onshore infrastructure to support their exploitation. The wave power density off Humboldt ranges from 30-40 kW/m, ranking ours among the best resources in the U.S. The offshore wind resource near Humboldt Bay is also among the best in the nation, and wind developers including Makani Power and Nautica Wind Power have explored Humboldt as an offshore wind site. Humboldt Bay is the only deep-water port in the state north of San Francisco, with substantial port infrastructure and power interconnection capacity. The Humboldt Bay Harbor District has just acquired a large dockside site, formerly occupied by a pulp mill, with plans to renovate it for use as a marine energy research facility, among other uses.

The Commission's draft plan notes that an important role for EPIC funds can be as cost share for federal funding, thereby using state funds to leverage potentially much larger investments from DOE and other federal agencies. We would like to point out the potential for such leveraging in offshore energy, for which the federal government has already shown interest and support for development off California's coast. DOE supported WaveConnect with \$1.2 million in federal funding (DOE contract FG36-08GO18170) and will contribute \$750,000 to the CalWave project (under DE-FOA-0000847). Each of these projects required substantial non-federal cost share contributions. EPIC support could provide needed cost share for future requests for federal offshore energy funding, helping to ensure that a substantial share of these federal funds are directed to the development of renewable energy in California.

Thank you for the opportunity to comment on the second triennial investment plan for EPIC.

Sincerely,



Arne Jacobson
Director